**IT Applications, Unit 4**

**Ch 6, Developing a solution using spreadsheet software, p 192-213**

Case Study: Point Pleasant Social Service Program – organisational outline and current practice

**Designing spreadsheet solutions and output**

1. Describe what is involved in the solution design stage.

**Spreadsheet Design Tools**

Elaborate under each of the following design tools:

1. IPO chart

A IPO (Input Process Output) chart can be used to show how data is being processed into meaningful information. Alternately refered to as a defining diagram identifies what input data is required for the solution to produce the required output and the processing steps that it undertakes in the transformation.

1. Flow chart, (list what each of the symbols mean from fig. 5-10.

* A is a process
* A is a input/output step
* A is a save
* A with arrows is a decision with the arrow with the correct logic being the direction.

1. Formula list

A formula list is similar to data dictionary and shows a detailed list of formulas that are required to achieve the output identified in the IPO. At this stage the formulas should still be in plain English rather than software specific.

1. Structure chart

A structure chart is a graphic representation of how the spreadsheet solution might work. As the end solution will generally involve multiple sheets in the workbook it should also show how they interrelate. In addition it gives the developer an overall picture of how large the workbook is and the intended use of each sheet.

1. Layout diagrams

A layout diagram shows the basic layout of each type of worksheet in the solution clearly indicating; type of data to be entered, content indication for cells, labels, validation rules and error messages, and the aesthetics including size, font colour the likes.

**Formats and conventions, p 202-**

1. list under each of the following subheadings the major formats and conventions that apply to spreadsheets:
   1. numerical information

* numbers right-aligned in columns (used for validation)
* money values have 0 or 2 decimal places
* align decimal points (within a column and in totals) by using a consistent number of decimal places.
* Percentages in columns appear with the (%) at the top of the columns rather than with the data.
* Subtotals have a single line above the total
* Grand totals have a single or double line below the total
* Grand totals are in bold
* Symbols indicating the unit of measure such as %,$, kg ect usually appear in the column heading.
* Use named ranges of cells to make formulas easier to understand.
  1. financial reports
* use a space or a comma to separate numbers >999 for example 1999
* use italics to indicate additional or subtraction
* subtotals have a single line above the totals
* include the $ sign in column heading rather than next to it
* right align dates to allow for double figures.
  1. charts and graphs
* must have titles identifying the name of the organisation and purpose for the graph.
* The axis must be labelled
* Use a key if more than one set of data is provided on the same graph or chart
* Include author identification and/or source of data, date and a filename (if appropriate)
* Include unit of measurement on the relevant axis
* Label each segment of a pie chart with it going from largest to smallest starting at the 12 o’clock position
* Include the absolute figures as well as %
* Choose colours that match the information being discussed
* Use bar charts to show the differences between values or to show changes over a period of time.
* Use pie charts to compare parts of a whole or relationships between segments
* Use graphs to show trends or relationships between values on each axis
* If more than one line is used in a line graph, vary the thickness or line type of each one.
* Limit the number of items to 5-6

1. Describe the file naming conventions for spreadsheets.

Common file naming conventions for spreadsheets include standard things such as ensuring that the name indicates its purpose and any time period it covers while keeping short. Ie newslettermay15.pdf

**Designing a macro**

1. What is a macro?

A macro is an automated series of tasks that can be created by script or recording->script. They can be planned using pseucode.

**Validation**

1. Describe each of the following types of validation used in a spreadsheet:
   1. Range checking

Range checking involves checking to ensure that data falls within a certain data range.

* 1. Existence checking

Existence checking can be used to ensure that a cell has a value in it, code or otherwise ensuring a complete/unaltered result

* 1. Conditional formatting

Conditional formatting allows for rules to be used to specify how a cell will be formatted ie if red back ground if outside of a preset range.

* 1. Data type checking

Data type checking can occur via Alignment of text or the likes. As it checks if the data needs to be of a particular type it helps prevent wrong data being entered.

* 1. Restricted data entry

Restricted data entry is the best way to ensure that data entered is valid to restrict data

* 1. Validation alerts

As part of the data entry process, electronic data valiadation methods will alert the user of the data being incorrect **and** why. This may be done via the validation method or by use of a if statement.

**Planning to test a spreadsheet solution**

1. What is the difference between validation and testing?

Validation is a process used during entering to try and ensure correct data entry where as testing is ensuring that the solution and related output is correct, likewise ensuring the electronic validation works.

1. When is the test plan or test table created?

The test plan or test table is created in the design phase to determine the requirements.

1. Attributes or properties to a spreadsheet solution that need to be tested; elaborate under each of the following testing types:

\*for all below screen dumps can be handy

* 1. Functionality testing

Functionality testing relates to the activities or actions that it was designed to carry out. Ie look at the original problem and see if it meets it. Systematically test if, lookups and other formulas for every possible outcomes. Test upper, lower and within range values by thinking critically what should and shouldn’t work.

* 1. Presentation testing

Presentation testing determines if the message has been communicated as well as what the best form (chart, report, list of results) is. One of the most important considerations should be the intended audience as a complex form with multiple data wouldn’t suit a audience requiring a single figure. As looks alone can be hard to determine if good the use of checking formats and conventions will help. Common examples include;

* Appropriate white space and font use
* A balance between the text and images
* Contrast

Though of course it isn’t limited to just these

* 1. Usability testing

Usability testing is ensuring that they are user friendly with required information being simple to reach. This also is used to ensure that all functions are working correct and help is easily determined. Common tests include;

* Minimal scrolling required with a max of 2 pages or important pieces freezed to ease.
* Are things such as the worksheets labelled for clear direction in navigation.
* Is it easy to get back to a index or intro page
* Are any info and buttons commonly placed.
* Are hyperlinks the only underlined unless clearly specified
* **Can the user delete formulas or change things essential to its use** or otherwise that shouldn’t be changed. Ie is only things protected where they should.
  1. Accessibility testing

Accessibility testing is commonly testing to ensure the solution will work for people with disability. These tests include;

* Does it open up where it should
* Are font sizes easy to read
* Is colours good
* Ect
  1. Communication of message

This testing ensures that no matter what the format the message is clear and obvious hence minimal superfluous information, ‘keep it simple’.

**Evaluating the solution and output**

1. What does evaluation consider?

Evaluation considers the efficiency and the effectiveness of the solution. This usually takes place after solution implementation for a period of time.

1. What information needs to be gathered?

Information such as the various users views, the success and the correctness of the solution for the required task.

1. Who is best to undertake the evaluation?

This step is usually completed by someone other than the developer to minimise impartial results

1. When are the evaluation criteria developed?

The evaluation criteria was developed in the design stage of the problem solving methodology so designers know which features to include.